

Biometric Based Automatic Vehicle Starter

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ABSTRACT

Due to the rising number of vehicle thefts, vehicle security is a pressing concern in today's society. Handling keys in automobiles is another issue. Keys must be carried, and losing or misplacing them will be a serious problem. Using a fingerprint-authenticated vehicle starter system, this issue can be resolved. The system makes it easy and secure to start or stop the engine of a vehicle. To start the vehicle, the user only needs to scan their finger, no key is required. Only authorized users are permitted to start the vehicle by the system. By scanning their fingerprints, users can first sign up for the system. Multiple users can sign up to authorized by the system. When the system enters monitoring mode, it checks the authenticity of the users. The system checks the user's authorization before starting the vehicle for only authorized users during scanning. Here Arduino microcontroller is made use of. The microcontroller is connected to the fingerprint sensor, push buttons, a motor driver, a starter motor and LCD display are used. The motor serves as the vehicle's starter in the demonstration. Using a fingerprint-based system, this system automates vehicle security in addition to doing so.

INTRODUCTION

In the contemporary world, automobiles are a big part of daily life. It is fundamentally necessary for every family. The history of automobile started with the invention of wheel and has been advancing ever since. The automobile we know today evolved as a result of the development of the steam engine. In the past, vehicles were ignited by crank shaft mechanisms.



Leaving that regular technique behind came in the idea of lighting the vehicles utilizing key. Pushstart buttons are taking the place of keys right now. The primary objective here is to eliminate the traditional use of keys for vehicle start-up. Since the introduction of biometric in the 18th century, technological advancements in security have reached new heights. The Greek words "Bio" and "Metrics," where "Bio" means "life," and "Metrics" "means" to measure, "are what give rise to the field of biometric. The four significant techniques utilized in Biometrics are: Voice, face, palm, iris. There are numerous additional approaches, but these four are the most significant. Nowadays, there is a lot of emphasis placed on vehicle security because of the rise in vehicle thefts. Handling the keys to the automobiles are another problem. Keys must be carried, and losing or misplacing them will be a severe problem. This issue has a remedy that involves a fingerprint-authenticated vehicle starter system. Biometric-based security, is now being used by almost all automobile manufacturers. In comparison to other biometric sensors, fingerprint sensors are relatively inexpensive. Additionally, they are somewhat simpler to maintain. The justification behind going into biometrics is that its possibilities being copied are extremely less. The technology offers a convenient and safe way to start and stop a vehicle's engine. The owner doesn't need a key to start the vehicle; instead, they just have to scan their finger. The automobile can only be started by people who are authorized by the system. Owners can sign up for the system by scanning their fingerprints. Multiple people can register as authorized users on the system. When in monitoring mode, the system searches for users to scan. Utilizing an Atmega32 Microcontroller, the system uses scanning to determine whether the user is an authorized user and only allows them to start the vehicle. The starter motor, push buttons, LCD display, Arduino microcontroller, and all other components are linked to the fingerprint sensor. The motor is used to show how to start a vehicle. This system automates access control and vehicle security using a fingerprint-based mechanism. The second goal is to lower the price of this technology, which in the present day is available only from premium manufacturers. This is compatible with any two-wheel drive vehicle. Here simplification has been done keeping in view ¾

wheeler.

LITERATURE SURVEY

Sayantam Sadhukhan, Aritra Acharyya, and Rajendra Prasad (2017) describe the relevance of IoT with mobile applications in their essay "Car Security System employing Fingerprint Scanner and IOT", released in Indian Journal of Science and Technology. They go on to say how crucial it is to maintain our automobiles as safe as we maintain our cell phones. The team discusses how to use a biometric auto entry system to keep your vehicle safe. It only permits numerous people to utilise the automobile if they have been given permission. The employment of a mobile application is advantageous in this case. When the automobile is robbed, it sends a notification to the owner.

Rajeev Velikkal (2019) outlines the demonstration of a keyless automobile entry system in his project, which was published in the Indian Journal of Science and Technology. He created this unit with the help of an Arduino kit, which he drew and programmed. Simple programming languages are used to create the design.

As per a 2013 research paper titled "Fingerprint based locking system," the author created this work specifically to increase the bike's safety. The objective of this work is to investigate and comprehend the notion of the Fingerprint Module. Fingerprint Unit, Relay, Buzzer, and Arduino Module are all used in this application. The proposal also employs the usage of a buzzer as a signalling device. The owner of the bike can add or remove fingerprints, permitting or disallowing anyone to ride the motorcycle. [2] The biggest drawback of this idea is that once the battery runs out, the device will not operate. In addition, because the ignition system is built for several purposes, the cost of the system is still expensive.

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EMBEDDED SYSTEM:

An embedded system designed for web surveillance with Home Assistant integration and fire and gas sensors represents a sophisticated solution for enhancing home safety and security. At its core, the system comprises hardware and software components tailored to interact seamlessly with the environment. Fire and gas sensors play a pivotal role in detecting potential hazards, such as fires or gas leaks, offering real-time data to the embedded system. Integration with Home Assistant expands functionality by enabling users to receive alerts, automate responses, and monitor sensor data through a familiar interface.

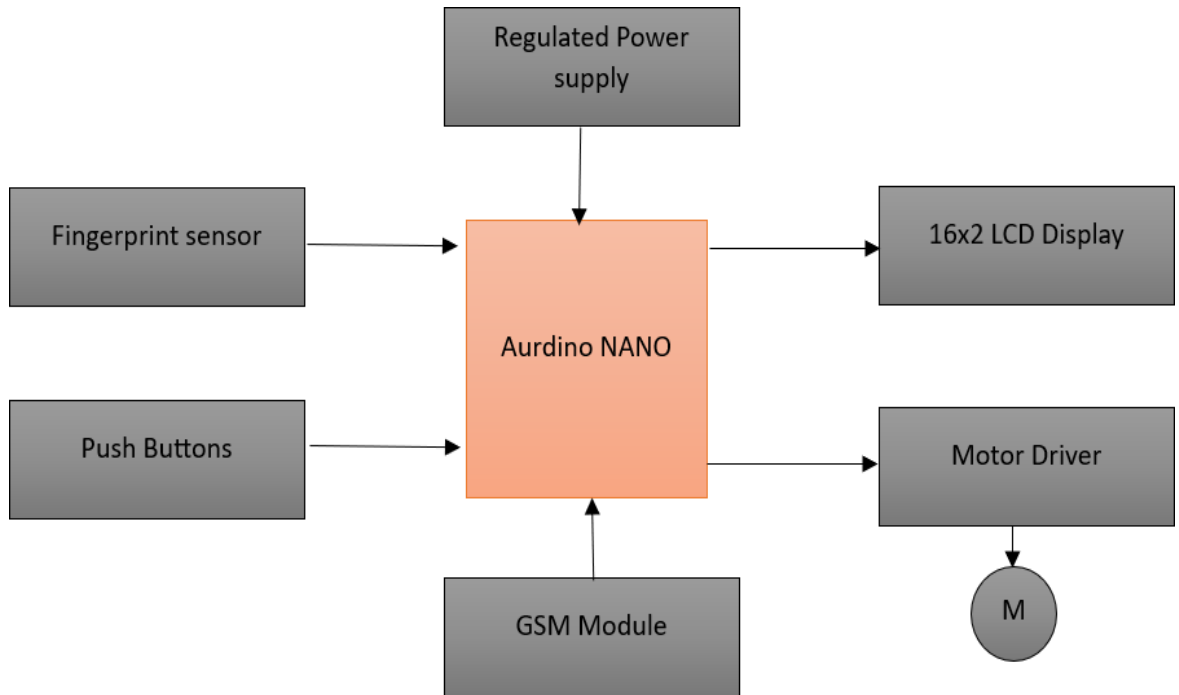
The web surveillance aspect extends this functionality further, allowing users to remotely access live or recorded video feeds from within their homes via a web browser. This system prioritizes security, employing encryption for data transmission, robust authentication mechanisms, and alerting features to notify users promptly in the event of emergencies. Ultimately, the embedded system empowers homeowners with comprehensive monitoring capabilities, seamlessly integrated into their existing home automation ecosystem for enhanced safety and peace of mind.

METHODOLOGY

Implementing a biometric-based automatic vehicle starter involves several key steps. Firstly, a biometric identification method such as fingerprint, iris scan, or facial recognition is chosen for user authentication. Next, the selected biometric sensor is integrated with the vehicle's starter system. Algorithms are then developed to process biometric data and authenticate users by comparing the data with stored templates. Users are allowed to securely register their biometric data within the vehicle's system. Robust security measures, including encryption and anti-spoofing techniques, are implemented to prevent unauthorized access. The biometric authentication system is connected with the vehicle's starter system to enable automatic vehicle starting upon successful authentication. Thorough testing is conducted to ensure reliability, accuracy, and security. A user-friendly interface is designed to guide users through the authentication process and provide

feedback. Compliance with relevant regulations and standards regarding biometric data handling and vehicle security is ensured. Regular maintenance and updates are performed to address any security vulnerabilities and improve system performance.

BLOCK DIAGRAM



COMPONENTS

- 1.Aurdino NANO
- 2.LCD Display
- 3.GSM Module
- 4.Fingerprint Sensor
- 5.Buzzer
- 6.Push Buttons
- 7.DC Motor

SOFTWARE USED

Arduino, an open-source prototype platform, revolutionizes hardware development with its user-friendly approach. Comprising a programmable circuit board (microcontroller) and the Arduino IDE (Integrated Development Environment), it empowers enthusiasts and professionals alike to create innovative projects. The Arduino IDE features a comprehensive toolkit, including a text editor for coding, a message area for feedback, and a console for debugging. Its intuitive interface includes a toolbar with common functions and a range of menus for seamless navigation.

The design is divided into two main parts: the transmitter and the receiver, as illustrated in Figure 3. The transmitter includes the alcohol sensor and the tilt sensor. The alcohol sensor detects alcohol substances prior to riding, while the tilt sensor identifies angular movement. The receiver comprises the GPS and GSM modules.

RESULT

Once the fingerprint is verified as authorized, the Motor gets started and “VEHICLE STARTED MOTOR ON” will be displayed on the LCD.



If the fingerprint is verified as non-authorized, then motor does not gets started and “INVALID FINGER MOTOR OFF” will be displayed on the LCD.



CONCLUSION

Integrating biometric technology into automatic vehicle starters provides enhanced security and convenience. By requiring a unique biometric identifier for ignition, such as fingerprints or facial recognition, the system ensures only authorized users can start the vehicle. This not only prevents unauthorized access but also eliminates the need for physical keys, reducing the risk of theft. Additionally, the seamless and swift authentication process enhances user experience, making it a promising solution for modern vehicle security systems. Moreover, the implementation of biometric-based automatic vehicle starters contributes to the overall trend of integrating advanced technologies into automotive systems, aligning with the growing demand for smart and connected vehicles. With biometric authentication, users can enjoy a personalized and secure driving experience tailored to their individual identity.

REFERENCES

- [1] K. Dinesh Kumar, G. Nirmal, S. Prakash, S. Raguvaran, "A Review of Bike Security System Using Fingerprint GSM&GPS", International Journal of Innovative Research in Computer and Communication Engineering (An ISO 3297: 2007 Certified Organization) Vol. 3, Issue 3, March 2015.
- [2] Karan Siyal and G. Gugapriya, "Anti-Theft Vehicle Locking System using CAN", Indian Journal of Science and Technology, Vol 9(45), DOI: 10.17485/ijst/2016/v9i45/105307, December 2016 ISSN (Print): 0974-6846 ISSN (Online): 0974-5645.



- [3] Mrs. Shubhangi Mali, professor J. A. shaikh, “Fingerprint based authentication and security system using GSM and GPS technology” , International Journal of Engineering Trends and Technology (IJETT)